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EXAMINER	
SENFI, BEHROOZ M	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/666,668	BHASKARAN, VASUDEV	
	Examiner	Art Unit	
	Behrooz Senfi	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) *1-5,12-19,26-28 and 35-39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-11,20-25 and 29-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/19/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 6 – 11, 20 – 25 and 29 - 34 in the reply filed on 3/23/2007 is acknowledged.

Drawings

2. The drawings submitted by applicant on 09/19/2003 are accepted.

Claim Objections

3. Claims 29 – 34 are objected to because of the following:

Claim 29 recites the limitation "the region type" in line 9. There is insufficient antecedent basis for this limitation in the claim. Examiner suggests that applicant change the above claimed limitation from "the region type" to "a region type" to correct lack of antecedent basis.

Claims 30 – 34 are objected based on the dependency to objected independent claim 29.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 20 – 25 are rejected under 35 U.S.C. 101 because; the claimed invention is directed to non-statutory subject matter.

Regarding claim 20, it is noted that, the claim invention "a computer readable medium for adaptively filtering a video signal prior to encoding, comprising" by it self

does not have functionality, and does not define any structural and functional interrelationship between the computer and the claimed elements: Since it fails to convey that "e.g. a computer readable medium having stored thereon a computer program and/or computer executable instruction" as required by the Interim Guidelines for Examination of Patent Application for Patent Subject Matter Eligibility (Official Gazette notice of 22 November 2005), and therefore does not fall within one of the four statutory classes of § 101.

Since claims 21 – 25 are dependent to claim 20, therefore claims 21 – 25 as a whole with respect to claim 20 do not fall within the statutory classes under 35 U.S.C. 101.

6. Claims 20 – 25 are rejected under 35 U.S.C. 101 because; the claimed invention is directed to non-statutory subject matter.

The USPTO "Interim Guidelines for Examination of Patent Application for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), reads as follows: Claim that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, pre se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal/carrier wave encoded with functional descriptive material fall within any of the categories of patent subject matter set forth in Sec. 101.

Regarding claim 20, it is noted that, the claim invention "a computer readable medium" defined in (specification page 5, paragraph 0051 as, distributed over a network

(e.g. signal/carrier wave)). While "functional descriptive material" may be claimed as a statutory product, when embedded on a tangible computer readable medium, a carrier wave embodying that same functional descriptive material is neither a process nor a product (i.e. a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal/carrier wave is a form of energy, in the absence of any physical structure or tangible material.

Since claims 21 – 25 are dependent to claim 20, therefore claims 21 – 25 as a whole with respect to claim 20 do not fall within the statutory classes under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 6 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yan (US 5,438,374).

Regarding claim 6, Yan '374 discloses, a method for adaptively filtering a video Signal prior to encoding (i.e. fig. 1, preprocessing 2 and pre-filter 3, col. 3, lines 16 – 19) comprising: calculating a local gradient indicative of a region type (i.e. the mathematical equation as shown in Col. 6, lines 40 - 45 of Yan, is consider "calculating local gradient", because this equation enable the temporal filter to differentiate between region, such as

stationary areas, transition areas, and moving areas by selecting a weight factor, e.g. lines 35 - 68 and Figs. 4 and 5), determining a weight factor based upon the local gradient (i.e. col. 6, lines 35-68 and Figs. 4 and 5, where discloses weighting factor α is determined based upon differences between areas, e.g. local gradient; thus the equation enable filter to differentiate between region, such as stationary areas, transition areas, and moving areas by determining a weight factor) and applying the weighted factor to a difference signal according to the region type (i.e. figs. 4 and 5, col. 6, lines 35-68 and col. 8, lines 66 – 68, where discloses multiplying, e.g. applying, the weighted factor α to a difference signal based on the region type; such as stationary areas, transition areas, and moving areas).

Regarding claim 20, it is noted that, the limitations as claimed are computer readable medium intended to perform the steps of the method of claim 6; Yan '374 discloses, a computer readable medium for adaptively filtering a video signal prior to encoding (i.e. fig. 1, preprocessor 2 and computer processor 50, col. 3, lines 16 – 19, are used for filtering a video signal) comprising: Yan '374 discloses, calculating a local gradient indicative of a region type (i.e. the mathematical equation as shown in Col. 6, lines 40-45 of Yan is consider "calculating local gradient", because this equation enable the temporal filter to differentiate between region, such as stationary areas, transition areas, and moving areas by selecting a weight factor as discussed in col. 6, lines 35-68 and Figs. 4 and 5), determining a weight factor based upon the local gradient (i.e. col. 6, lines 35-68 and Figs. 4 and 5, where discloses weighting factor α is determined based upon differences between areas, e.g. local gradient; thus the equation enable filter to

differentiate between region, such as stationary areas, transition areas, and moving areas by determining a weight factor) and applying the weighted factor to a difference signal according to the region type (i.e. figs. 4 and 5, col. 6, lines 35-68 and col. 8, lines 66 – 68, where discloses multiplying, e.g. applying, the weighted factor α to a difference signal based on the region type, such as such as stationary areas, transition areas, and moving areas), as for computer readable medium (please see; col. 3, lines, 16 – 19 and lines 41 – 44, where discloses programmed computer processor for performing the functions of the pre-filter). Therefore, the program instruction to be used by the computer processor 50 to perform the above steps for filtering a video signal prior to encoding would have been necessitated and implies in Yan's system.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 7 – 11, 21 – 25 and 29 – 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yan (US 5,438,374) in view of Hayashi et al. (US 6,041,145).

Regarding claim 7, Yan '374 teaches, calculating a local gradient indicative of a region type by filtering (pre-filtering) the video signal (e.g. picture) to reduces noise, using difference in pixel values in different areas/regions (please see, fig. 1, pre-filter 3 and col. 3, Lines 16 – 19, col. 6, lines 35-68 and figs. 4 and 5; where the mathematical equation as shown in Col. 6, lines 40-45 of Yan is consider "calculating local gradient",

thus the equation enable the filter to differentiate between region "e.g. pixel values differences", such as stationary areas, transition areas, and moving areas by selecting/determining a weight factor).

Yan '374 is silent in regards to explicit of "defining a neighborhood of values around a current pixel value; and quantifying a difference between each of the neighborhood of values and the current pixel value" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, defining a neighborhood of values around a current pixel value; and quantifying a difference between each of the neighborhood of values and the current pixel value (please see, col. 5, lines 48 – 50 and lines 61 – 65, where indicates target pixel value and its surrounding (e.g. neighborhood) pixels value and detecting/quantifying difference values between the target pixel and each of its surrounding pixels value) in the process of smoothing the picture signal by applying a smoothing filter to control the degree of noise influence and obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by taking difference values between the target pixel and each of its surrounding (e.g. neighboring) pixels, to smooth the picture signal and control the degree of noise influence to obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7 of Hayashi).

Regarding claim 8, the combination of Yan '374 and Hayashi '145 teaches,

applying a filter to the video signal (i.e. fig. 1, filter 3 and col. 3, Lines 16 – 19 of Yan) to create a noise reduced signal.

Yan '374 is silent in regards to explicit of "comparing the difference to a threshold value, and applying a smoothing function to the current pixel value when the difference is greater than the threshold value" as claimed.

Hayashi '145 teaches comparing the difference to a threshold value (please see, col. 10, lines 64 – 66 of Hayashi, where indicates determining whether the difference exceeds a certain threshold); and as for, applying a smoothing function to the current pixel value when the difference is greater than the threshold value (please see, col. 10, lines 64 – 67 of Hayashi, where indicates only when the difference exceeds a threshold value applying a smoothing function "e.g. filtering").

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi; and apply filtering process only if the difference exceeds a certain threshold "e.g. col. 10, lines 64 – 66 of Hayashi" to improve picture quality by decrease distortion occurred on a block boundary, as suggested by Hayashi (please see; col. 22, lines 43 – 45 of Hayashi).

Regarding claim 9, the combination of Yan '374 and Hayashi '145 teaches, applying a filter to the video signal (i.e. fig. 1, filter 3 and col. 3, Lines 16 – 19 of Yan) to create a noise reduced signal.

Yan '374 is silent in regards to explicit of "applying a smoothing filter to the video signal, and calculating a difference between the video signal and an output of the

smoothing filter, and representing the difference between the video signal and the output of the smoothing filter as the difference signal" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches the above subject matter (please see; in-loop filter 23 in fig. 1 of Hayashi, consider as applying a smoothing filter to the video signal; since, as indicated in col. 14, lines 59 – 60 of Hayashi, a smoothing filter is installed in the in-loop filter 23) and furthermore; as for "calculating a difference between the video signal and an output of the smoothing filter, and representing the difference between the video signal and the output of the smoothing filter as the difference signal"; it is noted that, as shown in (please see; fig. 1 of Hayashi, element 11 "e.g. subtracter" calculates the difference between the video signal 10 and an output of the smoothing filter 23; thus the output of the subtracter 11 provided to the encoder 12, represents the difference between the video signal and the output of the smoothing filter, which is a difference signal).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by using a smoothing filter and subtracter, to differentiate between the video/picture signal and the output of the filter signal (i.e. fig. 1, the output of smoothing filter that is installed in the filter 23 is being subtracted "e.g. fig. 1, element 11" from the video signal 10, and provides "e.g. represents" the difference signal to the encoder 12), to improve picture quality by decrease distortion occurred on a block boundary, as suggested by Hayashi (please see; col. 22, lines 43 – 45 of Hayashi).

Regarding claim 10, the combination of Yan '374 and Hayashi '145 teaches, receiving a signal (please see, fig. 1, processor 2 receiving a signal from the video source 1 of Yan) and applying a filter to the video signal (please see, fig. 1, filter 3 and col. 3, Lines 16 – 19 of Yan, where indicates applying a filter to the video signal) to create a noise reduce signal.

Yan '374 is silent in regards to explicit of "smoothing filter to the video signal and reduce a bit-rate", as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, applying a smoothing filter to the video signal and reducing bit-rate (please see; in-loop filter 23 in fig. 1 of Hayashi, consider as applying a smoothing filter to the video signal; since, as indicated in col. 14, lines 59 – 60 of Hayashi, a smoothing filter is installed in the in-loop filter 23, to smooth the picture signal and control/reduce degree of noise influence in input picture signal; thereby decreasing/reducing the bit rate/quantity) as suggested by Hayashi (i.e. col. 22, lines 42 – 53).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by using a smoothing filter to the video signal, to improve picture quality by smoothing the picture signal and control/reduce degree of noise influence in input picture signal thereby decreasing the bit rate/quantity, as suggested by Hayashi (i.e. col. 22, lines 42 – 53 of Hayashi).

Regarding claim 11, the combination of Yan '374 and Hayashi '145 teaches,

applying the weighted factor to a difference signal according to the region type (please see; figs. 4 and 5, col. 6, lines 35 -68 and col. 8, lines 66 – 68 of Yan; where indicates multiplying, e.g. applying, the weighted factor α to a difference signal "e.g. differences between region/areas, such as stationary areas, transition areas, and moving areas" based on the region type; such as stationary areas, transition areas, and moving areas).

Yan '374 is silent in regards to explicit of "constructing the weighted factor in a manner such that a higher weight factor diminishes a contribution of a smoothing filter" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches "constructing the weighted factor in a manner such that a higher weight factor diminishes a contribution of a smoothing filter" (please see, col. 4, lines 28 – 33 of Hayashi; where indicates, if the difference is great "e.g. edge exists" the weighting factor decreases, leading to a filtering, and vice verses; if the difference is small, the weighting factor increases, so that the surrounding pixel and the target pixel value are homogenized "e.g. which consider as, diminishes a contribution of a smoothing filter based on weighting factor").

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by the techniques of, weight smoothing scheme and the evaluation of its performance, to improve picture quality by smoothing the picture signal and control/reduce degree of noise influence in input picture signal thereby decreasing the bit rate/quantity, as suggested by Hayashi (i.e. col. 22, lines 42 – 53 of Hayashi).

Regarding claim 21, Yan '374 teaches, a computer readable medium (please see; fig. 1, preprocessor 2 and computer processor 50, col. 3, lines 16 – 19, are used for filtering a video signal) thus calculating a local gradient indicative of a region type (please see; the mathematical equation as shown in Col. 6, lines 40 - 45 of Yan, is consider "calculating local gradient", because this equation enable the filter to differentiate between region "pixel values differences", such as stationary areas, transition areas, and moving areas by selecting a weight factor, as discussed earlier in claim 6 above).

Yan '374 is silent in regards to explicit of "defining a neighborhood of values around a current pixel value; and quantifying a difference between each of the neighborhood of values and the current pixel value" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches the above subject matter (i.e. col. 5, lines 48 – 50 and lines 61 – 65 of Hayashi, indicates target pixel and its surrounding "e.g. neighborhood" pixels and detecting difference values between the target pixel and each of its surrounding pixels) in smoothing process to smooth the picture signal and control the degree of noise influence to obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7 of Hayashi).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by taking difference values between the target pixel and each of its surrounding (e.g. neighboring) pixels, to smooth the picture signal

and control the degree of noise influence to obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7). Furthermore; the computer readable medium 50 is capable of executing instructions to perform the filtering steps.

Regarding claim 22, Yan '374 teaches, computer readable medium (please see; fig. 1, preprocessor 2 and computer processor 50, col. 3, lines 16 – 19, used for filtering a video signal), determining a weighting factor based upon the local gradient (i.e. col. 6, lines 35 - 68 and Figs. 4 and 5, where indicates weighting factor α is determined based upon differences between areas, e.g. local gradient; thus the equation enable filter to differentiate between region, such as stationary areas, transition areas, and moving areas by determining a weight factor, as discussed earlier in claim 6 above) Furthermore; program instructions to be executed by the computer readable medium 50 to perform the above steps would have been obvious over the teaching of the above prior arts.

Yan '374 is silent in regards to explicit of "normalizing a difference between each of the neighborhood of values and the current pixel value" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, normalizing a difference between each of the neighborhood of values and the current pixel value (please see; col. 5, lines 48 – 60 "e.g. normalizing A/B; it is noted that, determination of sum (A) for normalization, includes detecting difference between a target pixel value and each of its surrounding pixels value" and further, col. 18, lines 5 – 15, indicates normalizing a difference between each pixel value).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by taking difference values between the target pixel and each of its surrounding "e.g. neighboring" pixels, to smooth the picture signal and control the degree of noise influence to obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7 of Hayashi). Furthermore; the computer readable medium 50 is capable of executing instructions to perform the filtering steps.

Regarding claim 23, Yan '374 teaches, the computer readable medium (please see; fig. 1, preprocessor 2 and computer processor 50, col. 3, lines 16 – 19, are used for filtering a video signal), further comprising; applying a filter to the video signal (please see; fig. 1, filter 3 and col. 3, Lines 16 – 19; indicates applying filter to the video signal to create a noise reduced signal).

Yan '374 is silent in regards to explicit of "smoothing filter and calculating a difference between the video signal and an output of the smoothing filter; and representing the difference between the video signal and the output of the smoothing filter as the difference signal" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches the above subject matter (please see; in-loop filter 23 in fig. 1 of Hayashi, consider as applying a smoothing filter to the video signal; since, as indicated in col. 14, lines 59 – 60 of Hayashi, a smoothing filter is installed in the in-loop filter 23) and furthermore; as for "calculating a difference between the video signal and an output of the smoothing filter,

and representing the difference between the video signal and the output of the smoothing filter as the difference signal"; it is noted that, as shown in (please see; fig. 1 of Hayashi, element 11 "e.g. subtracter" calculates the difference between the video signal 10 and an output of the smoothing filter 23; thus the output of the subtracter 11 provided to the encoder 12, represents the difference between the video signal and the output of the smoothing filter, which is a difference signal).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by using a smoothing filter and subtracter, to differentiate between the video/picture signal and the output of the filter signal (i.e. fig. 1, the output of smoothing filter that is installed in the filter 23 is being subtracted "e.g. fig. 1, element 11" from the video signal 10, and provides "e.g. represents" the difference signal to the encoder 12), to improve picture quality by decrease distortion occurred on a block boundary, as suggested by Hayashi (please see; col. 22, lines 43 – 45 of Hayashi). Furthermore; the computer readable medium 50 is capable of executing instructions to perform the filtering steps.

Regarding claim 24, Yan '374 teaches, the computer readable medium (please see; fig. 1, preprocessor 2 and computer processor 50, col. 3, lines 16 – 19, are used for filtering a video signal) further comprising; receiving a signal (see; fig. 1, processor 2 receiving the video signal from the video source 1) and in response to receiving the signal, applying a filter to the video signal (please see, fig. 1, filter 3 and col. 3, Lines 16

– 19, where indicates applying filter to the video signal to create a noise reduced signal).

Yan '374 is silent in regards to explicit of "smoothing filter to the video signal and reduce a bit-rate" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, applying a smoothing filter to the video signal and reducing bit-rate (please see; in-loop filter 23 in fig. 1 of Hayashi, consider as applying a smoothing filter to the video signal; since, as indicated in col. 14, lines 59 – 60 of Hayashi, a smoothing filter is installed in the in-loop filter 23, to smooth the picture signal and control/reduce degree of noise influence in input picture signal; thereby decreasing/reducing the bit rate/quantity) as suggested by Hayashi (i.e. col. 22, lines 42 – 53).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by using a smoothing filter to the video signal, to improve picture quality by smoothing the picture signal and control/reduce degree of noise influence in input picture signal thereby decreasing the bit rate/quantity, as suggested by Hayashi (i.e. col. 22, lines 42 – 53 of Hayashi). Furthermore; the computer readable medium 50 is capable of executing instructions to perform the filtering steps.

Regarding claim 25, Yan '374 teaches, the computer readable medium (i.e. fig. 1, preprocessor 2 and computer processor 50, col. 3, lines 16 – 19, are used for filtering a video signal); Yan '374 further teaches, applying the weighted factor to a difference

signal according to the region type (i.e. figs. 4 and 5, col. 6, lines 35-68 and col. 8, lines 66 – 68, where indicates multiplying, e.g. applying, the weighted factor α to a difference signal based on the region type; such as stationary areas, transition areas, and moving areas).

Yan '374 is silent in regards to explicit of "constructing the weighted factor in a manner such that a higher weight factor diminishes a contribution of a smoothing filter" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches "constructing the weighted factor in a manner such that a higher weight factor diminishes a contribution of a smoothing filter" (please see, col. 4, lines 28 – 33 of Hayashi; where indicates, if the difference is great "e.g. edge exists" the weighting factor decreases, leading to a filtering, and vice verses; if the difference is small, the weighting factor increases, so that the surrounding pixel and the target pixel value are homogenized "e.g. which consider as, diminishes a contribution of a smoothing filter based on weighting factor").

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by the techniques of, weight smoothing scheme and the evaluation of its performance, to improve picture quality by smoothing the picture signal and control/reduce degree of noise influence in input picture signal thereby decreasing the bit rate/quantity, as suggested by Hayashi (i.e. col. 22, lines 42 – 53 of Hayashi). Furthermore; the computer readable medium 50 is capable of executing instructions to perform the filtering steps.

Regarding claim 29, Yan '374 teaches, an integrated circuit (i.e. fig. 1) comprising; circuitry for filtering a video signal prior to transmission to an encoding loop (please see; fig. 1, circuitry 2 and 3, col. 3, lines 16 – 19, are used for filtering a video signal prior to transmission to an encoder), circuitry for calculating a local gradient indicative of a region type (i.e. fig. 1, circuitry 2 and 3; the mathematical equation as shown in Col. 6, lines 40 - 45 of Yan, is consider "calculating local gradient", because this equation enable the temporal filter to differentiate between region, such as stationary areas, transition areas, and moving areas by selecting a weight factor, e.g. lines 35 - 68 and Figs. 4 and 5), and circuitry for determining a weight factor based upon the local gradient (i.e. col. 6, lines 35-68 and Figs. 4 and 5, where discloses weighting factor α is determined based upon differences between areas, e.g. local gradient; thus the equation enable filter to differentiate between region, such as stationary areas, transition areas, and moving areas by determining a weight factor) and applying the weighted factor to a difference signal according to the region type (i.e. figs. 4 and 5, col. 6, lines 35-68 and col. 8, lines 66 – 68, where discloses multiplying, e.g. applying, the weighted factor α to a difference signal based on the region type; such as stationary areas, transition areas, and moving areas).

Yan '374 is silent in regards to explicit of calculating "gradient between a pixel value and a neighboring pixel value associated with the signal" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, gradient weighted means of a target pixel value and its surrounding/neighboring pixels value

associated with the signal, as discussed in (col. 3, lines 62 – col. 4, lines 7 and col. 5, lines 46 – 50 of Hayashi).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by taking difference values between the target pixel and each of its surrounding pixels "e.g. neighboring pixels", to smooth the picture signal and control the degree of noise influence to obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7 of Hayashi).

Regarding claim 30, the combination of Yan '374 and Hayashi '145 teaches, circuitry for calculating a local gradient indicative of a region type (i.e. fig. 1, circuitry 2 and 3; the mathematical equation as shown in Col. 6, lines 40 - 45 of Yan, is consider "calculating local gradient", because this equation enable the temporal filter to differentiate between region, such as stationary areas, transition areas, and moving areas by selecting a weight factor, e.g. lines 35 - 68 and Figs. 4 and 5 of Yan)

Yan '374 is silent in regards to explicit of "defining a neighborhood of values around a current pixel value; and quantifying a difference between each of the neighborhood of values and the current pixel value" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, defining a neighborhood of values around a current pixel value; and quantifying a difference between each of the neighborhood of values and the current pixel value (please see, col. 5, lines 48 – 50 and lines 61 – 65 of Hayashi, where indicates target pixel value and

its surrounding (e.g. neighborhood) pixels value and detecting/quantifying difference values between the target pixel and each of its surrounding pixels value) in the process of smoothing the picture signal by applying a smoothing filter to control the degree of noise influence and obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7 of Hayashi).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by taking difference values between the target pixel and each of its surrounding (e.g. neighboring) pixels, to smooth the picture signal and control the degree of noise influence to obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7 of Hayashi).

Regarding claim 31, the combination of Yan '374 and Hayashi '145 teaches, circuitry for determining a weight factor based upon the local gradient (please see; col. 6, lines 35-68 and Figs. 4 and 5 of Yan, where discloses weighting factor α is determined based upon differences between areas, e.g. local gradient; thus the equation enable filter to differentiate between region, such as stationary areas, transition areas, and moving areas by determining a weight factor, as discussed earlier in claim 6 above)

Yan '374 is silent in regards to explicit of "normalizing a difference between each of the neighborhood of values and the current pixel value" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, normalizing a difference between each of the neighborhood of values and the current pixel value

(please see; col. 5, lines 48 – 60 "e.g. normalizing A/B; it is noted that, determination of sum (A) for normalization, includes detecting difference between a target pixel value and each of its surrounding pixels value" and further, col. 18, lines 5 – 15, indicates normalizing a difference between each pixel value).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by taking difference values between the target pixel and each of its surrounding "e.g. neighboring" pixels, to smooth the picture signal and control the degree of noise influence to obtain a high quality picture, as suggested by Hayashi '145 (i.e. col. 5, lines 44 – 50 and line 60 – col. 6, lines 7 of Hayashi). Furthermore; the computer readable medium 50 is capable of executing instructions to perform the filtering steps.

Regarding claim 32, the combination of Yan '374 and Hayashi '145 teaches, integrated circuit (i.e. fig. 1, circuitry used for filtering a video signal of Yan), further comprising; circuitry for applying a filter to the video signal (please see; fig. 1, filter 3 and col. 3, Lines 16 – 19, applying filter to the video signal to create a noise reduced signal of Yan).

Yan '374 is silent in regards to explicit of "smoothing filter and calculating a difference between the video signal and an output of the smoothing filter; wherein the difference between the video signal and the output of the smoothing filter represents the difference signal" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches the above subject matter (please see; in-loop filter 23 in fig. 1 of Hayashi, consider as applying a smoothing filter to the video signal; since, as indicated in col. 14, lines 59 – 60 of Hayashi, a smoothing filter is installed in the in-loop filter 23) and furthermore; as for "calculating a difference between the video signal and an output of the smoothing filter, and representing the difference between the video signal and the output of the smoothing filter as the difference signal"; it is noted that, as shown in (please see; fig. 1 of Hayashi, element 11 "e.g. subtracter" calculates the difference between the video signal 10 and an output of the smoothing filter 23; thus the output of the subtracter 11 provided to the encoder 12, represents the difference between the video signal and the output of the smoothing filter, which is a difference signal).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by using a smoothing filter and subtracter, to differentiate between the video/picture signal and the output of the filter signal (i.e. fig. 1, the output of smoothing filter that is installed in the filter 23 is being subtracted "e.g. fig. 1, element 11" from the video signal 10, and provides "e.g. represents" the difference signal to the encoder 12), to improve picture quality by decrease distortion occurred on a block boundary, as suggested by Hayashi (please see; col. 22, lines 43 – 45 of Hayashi).

Regarding claim 33, the combination of Yan '374 and Hayashi '145 teaches,

further comprising; circuitry for receiving a signal (please see; fig. 1, circuit 2 receiving the video signal from the video source 1 of Yan) and circuitry for applying a filter to the video signal (please see, fig. 1, filter 3 and col. 3, Lines 16 – 19, where teaches applying filter to the video signal to create a noise reduced signal of Yan).

Yan '374 is silent in regards to explicit of "smoothing filter, and reduce a bit-rate" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches, applying a smoothing filter to the video signal and reducing bit-rate (please see; in-loop filter 23 in fig. 1 of Hayashi, consider as applying a smoothing filter to the video signal; since, as indicated in col. 14, lines 59 – 60 of Hayashi, a smoothing filter is installed in the in-loop filter 23, to smooth the picture signal and control/reduce degree of noise influence in input picture signal; thereby decreasing/reducing the bit rate/quantity) as suggested by Hayashi (i.e. col. 22, lines 42 – 53).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by using a smoothing filter to the video signal, to improve picture quality by smoothing the picture signal and control/reduce degree of noise influence in input picture signal thereby decreasing the bit rate/quantity, as suggested by Hayashi (i.e. col. 22, lines 42 – 53 of Hayashi).

Regarding claim 34, the combination of Yan '374 and Hayashi '145 teaches, circuitry for applying the weight factor to a difference signal according to the region type (i.e. figs. 1, 4 and 5, col. 6, lines 35-68 and col. 8, lines 66 – 68 of Yan, where discloses

multiplying, e.g. applying, the weighted factor α to a difference signal based on the region type; such as stationary areas, transition areas, and moving areas).

Yan '374 is silent in regards to explicit of "constructing the weighted factor in a manner such that a higher weight factor diminishes a contribution of a smoothing filter" as claimed.

Hayashi '145 in the same field of filtering picture signal teaches "constructing the weighted factor in a manner such that a higher weight factor diminishes a contribution of a smoothing filter" (please see, col. 4, lines 28 – 33 of Hayashi; where indicates, if the difference is great "e.g. edge exists" the weighting factor decreases, leading to a filtering, and vice verses; if the difference is small, the weighting factor increases, so that the surrounding pixel and the target pixel value are homogenized "e.g. which consider as, diminishes a contribution of a smoothing filter based on weighting factor").

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the filtering process of Yan in accordance with the teaching of Hayashi, by the techniques of, weight smoothing scheme and the evaluation of its performance, to improve picture quality by smoothing the picture signal and control/reduce degree of noise influence in input picture signal thereby decreasing the bit rate/quantity, as suggested by Hayashi (i.e. col. 22, lines 42 – 53 of Hayashi).

Contact

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Behrooz Senfi** whose telephone

number is **(571) 272-7339.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mehrdad Dastouri** can be reached on **(571) 272-7418.**

Hand-delivered responses should be brought to Randolph Building, 401 Dulany Street, Alexandria, Va. 22314.

Any inquiry of a general nature or relative to the status of the application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is **(571) 272-6000,**

Or faxed to:

(571) 273-8300

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B.M.S.

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